

REMARKS

Applicant provides the present Amendment in response to the thorough examination of the present application that is evidenced in the Office Action of January 25, 2005.

Applicant appreciates the allowance of Claims 16-24 and the indication that Claims 2, 10 and 14-15 would be allowable if rewritten into independent form. As discussed below, Applicant believes that a careful review of the cited prior art reference reveals that it does not disclose or suggest the inventions recited in currently rejected Claims 1, 3-9 or 11-13. Accordingly, for the reasons discussed below, Applicant respectfully submits that all of the pending claims are in condition for allowance. Note that Applicant has amended Claim 1 to correct a typographical error.

I. The Pending Claim Rejections

Claims 1, 3-9 and 11-13 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,636,173 to Schaefer ("Schaefer"). Pending Claim 1 recites:

1. A method of precharging a bank of memory cells in a semiconductor memory device, the method comprising:
 - receiving a command that includes an auto-precharge function to the semiconductor memory device;
 - initiating a timer in response to the received command; and
 - automatically precharging the bank responsive to the timer reaching a predetermined value.

The Office Action states that Col. 4, lines 54-59 of Schaefer discloses "initiating a timer in response to the received command" and that Col. 4, lines 65-67 of Schaefer discloses "automatically precharging the bank responsive to the timer reaching a predetermined value." The Office Action further identifies the "burst counter 60" of Schaefer as comprising the timer recited in Claim 1.

Applicant respectfully submits that the cited portions of Schaefer do not disclose or suggest the invention of Claim 1. As an initial matter, the device disclosed in Schaefer clearly does not automatically precharge a memory bank "responsive to" the burst counter 60 (i.e., the alleged timer) reaching a predetermined value. Instead, Schaefer states that the bank is automatically precharged "upon the completion of the READ command or the WRITE command." (See Schaefer at Col. 7, lines 40-45). In fact, Schaefer expressly states that the

"AUTO-PRECHARGE command insures that the precharge is initiated at the earliest valid stage within a burst cycle." (See Schaefer at Col. 7, lines 46-50). This is in contrast to Claim 1 where the device waits until a timer reaches a predetermined value. Thus, the burst counter **60** simply has nothing to do with setting the time at which the automatic precharge operation is performed, and Schaefer does not disclose or suggest "automatically precharging the bank responsive to the timer reaching a predetermined value" as recited in Claim 1.

More importantly, the burst counter **60** of Schaefer is not a timer. Instead, Schaefer clearly states that the burst counter **60** is used to count up from an initial column address so that the column address during each cycle of a burst read (or write) operation points to the correct column. As stated in Schaefer:

In a burst read having a length of four, the initial column address stored in column address latch **56** is used to activate sense amplifiers and I/O gating circuits **66** or **68** during the first burst cycle of the burst read operation.

Then, during the next three clock cycles, burst counter 60 counts up from the column address stored in the column address latch 56 . . .

(Schaefer at Col. 5, lines 15-21) (emphasis added). Thus, it is also clear that Schaefer does not disclose or suggest "initiating a timer in response to the received command" as recited in Claim 1.

Independent Claims 7, 12 and 13 stand rejected as anticipated by Schaefer based on reasoning similar to the reasoning used to reject independent Claim 1. In particular, with respect to each of Claims 7, 12 and 13 the Office Action states that burst counter **60** of Schaefer comprises the timer recited in those claims. However, as discussed above, the burst counter **60** of Schaefer is not a timer, and thus the rejections of Claims 7, 12 and 13 should be withdrawn. Additionally, with respect to Claim 12, Applicant respectfully submits that Schaefer does not disclose or suggest "delaying initiation of an auto-precharge operation . . . until the timer reaches a predetermined time", as is generally discussed above with respect to similar language included in Claim 1. With respect to Claim 13, Applicant submits that Schaefer further does not disclose or suggest "using a page mode operation to read a second data bit from a second cell in the first bank of cells." As discussed in the Background Section of the present application, conventional DRAM devices that include auto-precharge functions may not be able to operate in a page mode because a page that is opened may be closed after the completion of the read or write operation. (Application at 4-5). Applicant submits that this is what occurs in Schaefer, as evidenced by the statement in Schaefer that "when [the]

AUTO-PRECHARGE command is employed in SDRAM 20, the selected bank memory array must not be accessed until t_{RP} [i.e., the precharge time] is complete." (Schaefer at Col. 7, lines 52-55). In any event, the cited passages from Schaefer do not mention or suggest use of a page mode operation as recited in Claim 13. Thus, the above reasons provide additional grounds for withdrawal of the rejections of independent Claims 12 and 13.

Applicant further submits that the dependent Claims 3-6, 8-9 and 11 are patentable for at least the reasons that the claims from which they depend are patentable. In light of the above showing as to the patentability of each of the independent claims, Applicant will not at this time present arguments as to why each of the dependent claims are independently patentable over Schaefer.

II. The Drawing Objections

A revised set of drawings are attached that label Figs. 1A and 1B as "Prior Art."

III. Conclusion

Applicant again wishes to thank the Examiner for the thorough examination of the application. Applicant believes that, for the reasons discussed above, the claims are all in condition for allowance, which is respectfully requested. Should the Examiner have any questions, please feel free to call Applicants representative at (919) 854-1422.

Respectfully submitted,



D. Randal Ayers
Registration No. 40,493
Attorney for Applicants

Customer Number 20792

Myers Bigel Sibley & Sajovec, P.A.
P.O. Box 37428
Raleigh, NC 27627
919-854-1400
919-854-1401 (Fax)

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 20, 2005.



Traci A. Brown